

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
OFFICE OF NEW REACTORS
WASHINGTON, DC 20555-0001

February 27, 2008

**NRC REGULATORY ISSUE SUMMARY 2008-05
LESSONS LEARNED TO IMPROVE INSPECTIONS, TESTS,
ANALYSES, AND ACCEPTANCE CRITERIA SUBMITTAL**

ADDRESSEES

The U.S. Nuclear Regulatory Commission (NRC) applicants for early site permits, design certifications, or combined licenses to construct and operate nuclear power plants under Title 10, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52.

INTENT

The intent of this regulatory issue summary (RIS) is to communicate to addressees the good practices for submitting inspections, tests, analyses, and acceptance criteria (ITAAC) as part of their applications for early site permits, standard design certifications, or combined licenses. Applicants should consider incorporating these lessons learned into their applications to provide for a more efficient inspection and ITAAC closure process. No specific action or written response is required.

BACKGROUND

As required by 10 CFR Part 52, applicants for early site permits, standard design certifications, or combined licenses must submit, among other information, the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses (ITA) are performed and the acceptance criteria met, the facility has been constructed and will be operated in conformity with the license, the provisions of the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations. Following issuance of a combined license, a licensee completes the ITAAC contained in the combined license during construction and submits notification letters to the NRC in accordance with 10 CFR 52.99, "Inspection during Construction." The NRC subsequently verifies closure of all ITAAC through direct inspection or other methods, such as oversight of the licensee's ITAAC completion, closure, and approval processes.

SUMMARY OF ISSUES

Based on the review of recent ITAAC submittals to the NRC, the staff has identified four general categories in which ITAAC submittals could be improved. These areas include (1)

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ITAAC format and content, (2) ITAAC nomenclature and language, (3) ITAAC focus, logic, and practicality, and (4) ITAAC standardization and review.

ITAAC FORMAT AND CONTENT

- Applicants should consider using a consistent system to identify and number individual ITAAC within their applications. While an alphanumeric system has generally been used in past submittals, in some cases dashes or separate paragraphs with no labels were used in the body of the text to specify separate ITAAC requirements. In other cases, the alphanumeric designations were not consistently aligned for the applicable ITAAC table requirements. Use of a standard and consistent ITAAC identification system will minimize confusion.
- Applicants should consider a standard methodology for identifying and organizing the structures, systems, and components (SSCs) associated with an ITAAC to allow for a more efficient inspection and ITAAC closure process. For instance, if an applicant chooses to organize SSCs in a tabular format (as opposed to system drawings), they could organize instrumentation-related components (e.g., sensors) separately from mechanical components. Additionally, the applicant could list mechanical components, or a group of components that are likely to be closed together, in similar categories (e.g., pumps, valves).
- Applicants should consider avoiding the integration of several different engineering or construction areas into a single ITAAC. In one case, an applicant included all of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements and pipe break analyses for all the plant's piping into two ITAAC. In another instance, an applicant's definition for a system's "basic configuration" included five separate engineering and construction processes, but only two ITAAC were associated with them.

ITAAC NOMENCLATURE AND LANGUAGE

- All terms used in an ITAAC should clearly be defined. For example:
 - It is unclear whether an applicant using the terms "design reports" and "reports" in an ITAAC involving ASME Code piping and welding intends the ASME Code definition for "design report" and "data report" or its own definition for these terms.
 - In one instance, the term "as-installed" was frequently used but not defined. Apparently this term was used as a substitute for the term "as-built," which was defined.
- If applicants use terms such as "interfacing systems," "control room features," "minimum set," "seismic structure," "equipment qualification," "fast-closing" valves, and "rapid" depressurization, they should clearly define them. For instance, the term "equipment qualification," if not clearly defined, could be associated with the specific requirements

for environmental qualification delineated in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."

- The use of the conjunction "and/or" is generally not appropriate.
- If applicants use the phrase, "a report exists and concludes that...", they should consider specifying the scope and the type of report. For example, they should explain whether the scope of the report includes the design, the as-built construction (as reconciled with the design), or any other information.
- Applicants should be consistent in the use of specific technical terms (e.g., the terms "pressure" test and "hydrostatic pressure" test are interchanged; similarly, "internal" pressure and "design" pressure are used in the same ITAAC). Applicants should also take care not to confuse the "preoperational conditions" with the applicable "operation modes" in situations involving testing.

ITAAC INSPECTION FOCUS, LOGIC, AND PRACTICALITY

- Applicants should avoid applying a single ITAAC to a large area of construction or activities that are likely to be widely separated in time. Large-scoped ITAAC create problems with verification activities and with the timing of construction and other requisite inspections.
- Applicants should consider breaking ITAAC with a large number of SSCs into areas of construction. For instance, if an ITAAC envelops construction from the basemat to the top of containment and applies to several different buildings, the large area and scope create difficulties not only in tracking the applicable SSCs, but also in connecting the interdependent nature (e.g., seismic) of the applicable structures. Breaking a large single ITAAC into several areas will make the ITAAC closure process more efficient.
- Applicants that envision using modular construction should consider the impact of these activities in developing their ITAAC. For example, the inspection of as-built SSCs implies that "as-built" refers to the completion of construction at the final location at the plant site. However, if a module is fabricated at a remote location (e.g., a shipyard), the individual components within the module (e.g., a pipe support) would be in their final locations, even if the module had not yet been transported to the site. Such considerations will facilitate ITAAC inspections and timely closures.
- Applicants should consider the timing and sequence of construction activities in the development of related ITAAC. Breaking the ITAAC into pieces that can be completed in the early and mid-stages of construction would help alleviate the backlog of ITAAC closure activities at the end of the process.
- Applicants should ensure that design commitments and ITAAC are consistent. It is important for the language and details of the ITAAC to comport with the language of the design commitment. In one case, the design commitment indicates that the piping is designed and constructed in accordance with the ASME Code, but the acceptance criteria only require the existence of "design reports" (which would not normally encompass construction quality) for as-built piping.
- Applicants should ensure that the ITA and the associated acceptance criteria match. In

one case, the ITA required an “inspection” of a makeup water system. While three separate acceptance criteria were associated with this one ITA inspection, only two of the criteria were “inspections”; the third criterion specified a flow rate, which is a “test” result and not an “inspection” criterion.

ITAAC STANDARDIZATION AND REVIEW

- Applicants should ensure consistency in ITAAC designations within their applications. In one case, a count of the ITA designations identified 33 ITAAC, while a count of the acceptance criteria designations identified a total of 38 ITAAC. Such an inconsistent ITAAC count could result in problems not only during the conduct of verification and inspection activities, but also when the ITAAC are closed and the notification letters, in accordance with 10 CFR 52.99, are submitted.

BACKFIT DISCUSSION

This RIS requires no action or written response and is, therefore, not a backfit under 10 CFR 50.109, “Backfitting.” Consequently, the NRC staff did not perform a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because the RIS is informational and does not represent a departure from current regulatory requirements.

CONGRESSIONAL REVIEW ACT

The NRC has determined that this action is not a rule under the Congressional Review Act.

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain information collections and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, et seq.).

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

CONTACT

This RIS requires no specific action or written response. Please direct any questions about this matter to the technical contact listed below.

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Note: NRC generic communications may be found on the NRC public Web site,
<http://www.nrc.gov>, under Electronic Reading Room/Document Collections

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